A MODEL for EVALUATING the EFFECTS OF
RECREATION INFORMATION CAMPAIGNS and an
EVALUATION of BWCAW 1988 WILDERNESS
COMMUNICATION EFFORTS
by
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Communication Efforts

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Introduction

A major challenge to recreation managers is controlling the impacts of visitors while also facilitating quality recreation experiences. Because educational techniques, as opposed to direct management control, are relatively unobtrusive, they are considered highly desireable tools for meeting this challenge. Managers have repeatedly been encouraged to employ information and education methods.

Although there have been numerous calls for communications research, few studies are available to assist managers in developing, evaluating and refining communication techniques. Much of the available research focuses on the efficacy of specific modes of communication. For example, research has found signs effective in increasing and redistributing roadstop use (Brown and Hunt 1969), brochures (of varying types) effective in redistributing backcountry use (Roggenbuck and Berrier 1982; Krumpe and Brown 1981), in reducing campground littering (Christensen and Clark 1983) and in creating awareness of recreation being promoted (Baas et al 1988). Although these studies have offered valuable information in developing communication campaigns, their generalizability is limited due to the factors specific in the study, setting and application investigated. Future communication studies might be enhanced if they focused on basic elements of the recreation communication process which are measurable in a variety of different settings where information strategies might be employed. As a first step toward that end, the purpose of this study was to propose and

test a model of communication effects in recreation settings.
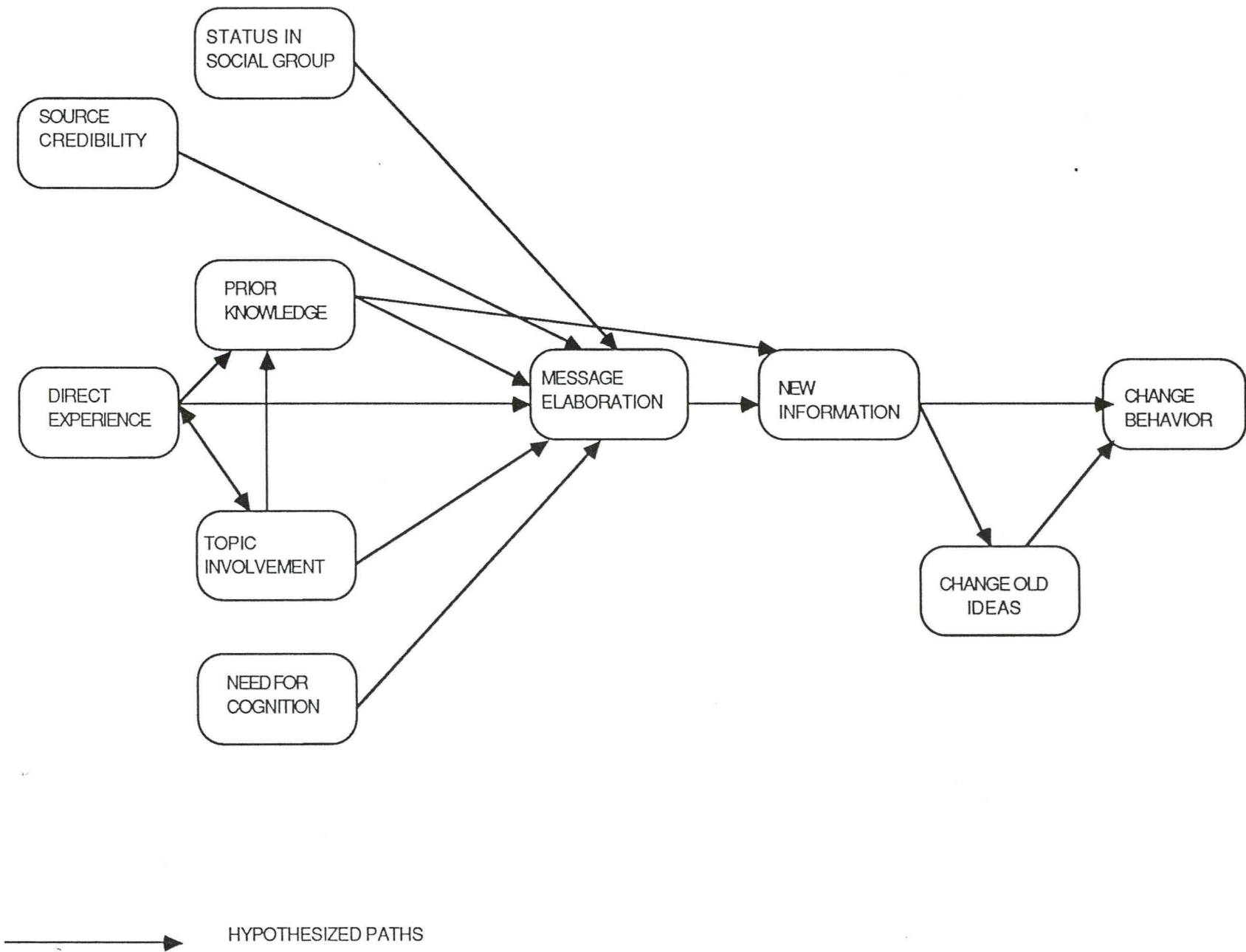
Theoretical Background

The model proposed in this study focuses on the cognitive process of persuasion and the recipient factors which affect this process.

Cognitive process of persuasion. An important distinction has been made between the processes involved in "high" versus "low" response persuasion (Craik and Lockhart 1972; Schneider and Shiffrin 1977; Abelson 1976; Langer et al 1978; Petty and Cacioppo 1986). The high response situations are those in which people engage in active analysis and evaluation of a persuasive message. Persuasion then results from the effect of new information upon pre-existing knowledge. Low response persuasion would occur when there is little actual processing of a persuasive appeal, rather the recipient is influenced by factors tangential to the message (e.g. attractiveness of the message or message medium).

The model proposed in this study addresses situations of high response to communication. This focus was taken because 1) managers are typically interested in creating enduring attitude change; theorized to occur primarily in high response processing and 2) the implicit strategy of most communication devices used by public land managers assumes recreationists will engage in a somewhat thoughtful analysis of messages presented.

Our model (Figure 1) was adapted from concepts introduced by

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STATUS IN
SOCIAL GROUP

SOURCE
CREDIBILITY

PRIOR
KNOWLEDGE

DIRECT
EXPERIENCE

MESSAGE
ELABORATION

NEW
INFORMATION

CHANGE
BEHAVIOR

TOPIC
INVOLVEMENT

CHANGE OLD
IDEAS

NEED FOR
COGNITION

HYPOTHESIZED PATHS

Petty and Cacioppo (1986) and reflects an emphasis on active processing of information. Petty and Cacioppo (1981, 1986) have proposed that when people are motivated and able to respond, they will engage in message elaboration and integration, which will result in attitude and behavior change. Elaboration and integration are key cognitive processes. Elaboration reflects the amount of thought devoted to a topic and integration reflects the extent to which message content is assimilated into existing belief structures. Our model adapts these concepts in proposing that the extent of elaboration devoted to messages will affect the extent to which old beliefs are changed. We view the acquisition of new information and shifts in old beliefs (either strengthening or weakening) as the primary outcomes of integration. Further, it is proposed that behavior change is determined by the extent of message integration (new ideas and change in old ideas).

Recipient Factors. Although it is generally recognized that a broad number of factors (categorized as message, medium, source and recipient) might influence persuasion, the model presented here focuses primarily on the recipient. This approach was taken because 1) while types of messages, mediums, and sources of delivery might vary greatly, recipient factors can readily be compared across recreation communication situations, 2) by focusing on recipient factors, results of communication studies can be more broadly generalized since a great deal of existing research in recreation has focused on describing characteristics

and preferences of recreation visitors and 3) a focus on recipient factors is consistent with trends in cognitive theories in psychology which focuses on internal factors which affect cognitive processes.

Four recipient factors were examined in this study: prior knowledge, direct experience, topic involvement and need for cognition. Further exploration was conducted by examining the effect that role in social group (e.g. group "leader" vs "follower") and source credibility (in this case, the U.S. Forest Service) may have on the behavioral change process.

A key component of a cognitive approach to persuasion involves the prior knowledge of an individual. Response to external environmental cues, like persuasive messages, is in large part dictated by how a person relates it to pre-existing information. A major factor which influences this process is the amount of information available to an individual (Kisielius and Sternthal 1984). Greater amounts of information held by an individual appear to affect the ease with which messages are processed (Johnson and Russo; Sujan 1985) and is associated with greater attitude-behavior consistency (Davidson et al 1985), and greater resistance to attitude change (Wood 1982). Furthermore, researchers have noted a decelerating set-size effect in which pieces of information added to evaluation of an object, become incrementally less important in influencing the overall attitude. As Davidson et al (1985) note, "with each additional piece of information, the overall evaluative judgement increases, but the

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amount of increase decreases (p. 1184)." In addition to being resistant to attitude change, there is some suggestion that those with greater prior knowledge are also less likely to search for new information.

Pre-existing information which has been obtained through direct experience appears to have a particularly important effect on how new information is processed. Research suggests that prior information obtained through direct experience (as opposed to indirect such as reading about an issue or being told about it) will result in higher attitude-behavior consistency (Fazio and Zanna 1981, Sample and Warland 1973) and will also result in attitudes held with greater certainty (Fazio et al 1983). Direct experience attitudes result in more favorable response to pro-attitudinal appeals and more resistant to counter attitudinal appeal (Wu and Shaffer 1987). Research tends to confirm the importance of direct past recreation experience as a mediator of new information. Roggenbuck and Berrier (1982) found a brochure with personal contact more effective with inexperienced backpackers (versus experienced backpackers) as a means of redistributing backcountry use. Similarly, Krumpe and Brown (1982) found that backpackers in Yellowstone who used their informational brochure had less experience backpacking in Yellowstone than those who did not use the brochure.

The level of topic involvement may have a significant effect on the amount of behavior change that occurs in an individual. People receive hundreds of messages per day (Assel 1984) and

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devote thought to very few of them. Petty and Cacioppo (1982) have suggested that people devote thought where there is motivation (and ability) to think about messages. Empirical findings support this by showing the relationship between the personal relevance of a topic and message elaboration. For example, high personal involvement with an issue has been related to high recall of messages (Leippe and Elkin 1987), message relevant thinking (Chaiken 1980), stronger counter arguments with weak messages (Petty et al 1979), and stronger attitude-behavior consistency (Petty et al 1981).

Initially, the idea of <u>need for cognition</u> was introduced by Cohen (1957) as "a need to structure relevant situations in meaningful, integrated ways. It is a need to understand and make reasonable the experiential world" (p. 291). Petty and Cacioppo (1982) have suggested that one's need for cognition may be an important variable in understanding response to communication. Furthermore, these researchers suggest that although there are many situational factors which might influence persuasion, need for cognition would be an important dispositional determinant of the extent of message elaboration and persuasion. Conclusions drawn by these researchers suggest that when levels of personal involvement are similar, those with higher levels of need for cognition should be more active in message elaboration.

The impact of <u>role in social group</u> has particular applied importance. Differential effects by group role may determine whether or not messages affect visitor behavior. Aveni (1976)

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found that inexperienced members of a recreation reference are strongly influenced by more experienced group members. In addition, Kirchler and Davis (1986) found that high status individuals within a group showed less tendency to exhibit behavior change when presented with a persuasive argument than were those persons representing a more subordinate role. This finding has important implications when one considers who is actually making the final decisions in a social group. For example, if persuasive appeals are affecting "group followers" as opposed to "group leaders", behavioral changes may not result. Furthermore, the educational function of communication would be diminished if only group leaders attended to it.

Petty and Cacioppo's (1981, 1986) Elaboration Likelihood Model (ELM) suggests that <u>source credibility</u> may have an effect on the level of persuasion, particularly in the case where there is a "low" response persuasion process occurring. Maddux and Rogers (1980) found that agreement with a source was greater if the source was an expert rather than a nonexpert on the communication topic. This suggests that this variable may have an effect on the extent to which one elaborates on information received from that particular source.

Hypotheses

The framework adopted for research proposed here suggests that attitude and behavioral change is a function of the extent to which message elaboration occurs. Message elaboration will

vary as a function of the recipient's prior knowledge, direct experience, motivation to respond as a result of personal involvement in the topic, one's need for cognition, role in social group and source credibility. Furthermore, message elaboration will have an effect on the level of behavioral change which occurs due to the level of new information obtained and the extent that the persuasive message changes the old ideas of the individual. From this framework, we examine a model (Figure 1) to explain what factors affect the level of message elaboration and subsequently, how message elaboration affects the level of attitude and behavior change.

Specifically, our hypotheses are as follows:

H1: The level of behavior change resulting from a persuasive communication will be affected by the amount of new information that is acquired and the extent to which the recipient's old ideas were changed.

H2: The level of message elaboration which takes place as a result of the persuasive communication will have a direct effect on the level of new information and the extent to which the recipient's old ideas were changed.

H3: The level of new information acquired as a result of the persuasive communication will be negatively related to the level of the recipient's prior knowledge.

H4: The extent to which the recipient engages in elaboration of the communication will be determined by the level of his or her prior knowledge, direct experience, personal involvement in the topic, need for cognition, role in social group and source credibility.

The prior knowledge of a user may be seen, in part, as a function of the level of other user characteristics such as topic involvement and direct experience, therefore the following hypotheses are also put forward.

H5:   The levels of personal involvement in the topic and
       direct experience will have a direct influence on the
       amount of prior knowledge possessed by the recipient.

H6:   There will be a direct two-way relationship between the
       level of personal involvement in the topic and the
       amount of direct experience possessed by the recipient.

                           Methodology

Study Setting. This study was conducted at the Boundary

Waters Canoe Area Wilderness in cooperation with the United

States Forest Service.   The BWCAW is located in the Superior

National Forest in northern Minnesota and is one of the most

popular wilderness areas in the United States.   The BWCAW is one

of the most popular wilderness areas in the eastern portion of

the United States.   In 1987 it received approximately 1.25

million visitor days of use.

     As part of an overall management strategy that includes

limited entry permits and enforcement, the BWCAW has implemented

a communications program in efforts to direct the use of visitors

in the area.   The primary means by which information is delivered

are 1) with an information packet delivered to those obtaining

permits via a mail-in request, 2) a user education program held

at various times through out the year in the region surrounding

the BWCAW 3) personal contact with individuals requesting permits

at U.S.F.S. offices and from outfitters (who are required to

discuss BWCAW rules when packaging trips for clients) 4) bulletin

boards at trail entrances and 5) a cooperative informational

program with outfitters.   The research proposed here was directed

toward people's responses (evidence of elaboration) to the

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information packet. This packet was received from the Forest Service by those users requesting a permit, through the mail and more than seven days prior to their trip, to use the BWCAW.

Sampling.The time frame for on-site sampling was July 23 to September 12, 1988. The specific sites used in data collection, which were arranged in cooperation with U.S.F.S. personnel, included Fall Lake, Lake One and Moose Lake. A random sample of time clusters were sampled for interviewing each day. Time clusters were 10 a.m.-1 p.m.; 1 p.m.-4 p.m.; and 4 p.m.-7 p.m.. All subjects exiting or entering during a sampled time cluster were included in the study. The two interviewers each sampled two time clusters (3-hour time blocks) per interview day. Interviewers sampled approximately 104 time clusters and collected data on approximately 51 different days.

Data Collection Instruments.Data for this study were collected using two instruments, 1) an on-site interview and 2) a self report questionnaire.

The purpose of the on-site interview was to obtain background information about the respondent; to obtain measures of the effects of each of the U.S.F.S. brochures sent or handed in person; if applicable, to obtain measures of the effects of on-site information provided by the U.S.F.S and/or outfitters; and to obtain names and addresses for the mail questionnaire sample. On site data collection was conducted in the following manner. Subjects were approached as they were taking out or entering. Interviewers identified themselves as members of a

University of Illinois research team who, in cooperation with the Forest Service, were conducting a user study at the area. Subjects were asked to participate in the study; however, if they refused, were asked to excuse the interruption and left alone. Subject interviews were done in a conversational mode with interviewers asking questions and recording responses. Subjects were not shown the on-site interview form.

The interviewer initially obtained information concerning the type of group involved, what activities they would be participating in, the size of the group and how long their stay in the BWCAW was. After obtaining this visitor background information, subjects were asked questions about the information they received from the Forest Service. This portion of the interview was prefaced by an appeal to the respondent for accuracy in recall (and not worry about what we think they should say) in order to avoid social desirability response bias. The complete array of pamphlets (i.e., those distributed with permits) included 1) "Safety First", describing boating safety and first aid issues, 2) "Camping with Bears", describing tips to prevent trouble with bears, 3) "Natural Fires in the Wilderness", explaining the Forest Service's policy on "prescribed fires", 4) "Wilderness Challenge", promoting minimum impact wilderness use, 5) "Group Size", explaining the BWCAW's rule concerning the maximum allowable size of a group and 6) "Gain While You Give", promoting opportunities available in volunteering to spend time in the BWCAW helping to preserve the area. These pamphlets were

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shown to the subject first as a group, then individually. The subjects were asked which, if any, they had ever seen. After indicating which of the pamphlets, if any, were recalled, a hierarchy of questions were asked to determine the level of elaboration, new information, changing of old ideas and changing of behavior which occurred for each pamphlet. Answers to these questions were elicited from the subject without allowing them to reread any portion of the pamphlets. For example, the first question, "What do you remember about the content of this brochure?", enabled the interviewer to measure, on a scale of one to five (with (1) representing none, (2) low, (3) some, (4) moderate and (5) high) the level of elaboration which took place concerning a particular pamphlet. The interviewer then asked the subject if any information in the pamphlet was new to him or her and measured this variable on a scale of one through four, with four indicating the highest level of new information. The subject was then asked if the information changed any of his existing ideas concerning the particular pamphlet and was rated as such on a scale of one through five, with five indicating the highest level of idea change. Finally, in order to measure the level of behavior change, the subject was asked if the information had or will have any effect on their behavior while in the BWCAW. This variable was measured on a scale of one through four, with four representing the highest level of behavior change. In addition to measuring the effects of each individual pamphlets, the interviewer made an evaluation of what

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effect the information packet, as a whole, had on the behavioral
change process. The on-site interview generally took only five
to ten minutes. At the conclusion of this aspect of the
interview, subjects were asked if they would be willing to fill
out a longer questionnaire, which would be sent to them later in
the mail. Names and addresses of those agreeing to participate
were recorded.

The initial mailing of the self report questionnaire, which
has measures of prior knowledge, direct experience, status in
social group, topic involvement, need for cognition and source
credibility, was sent in the month of September. Two weeks after
the first mailing, subjects were sent a postcard reminder if they
had yet to respond. Those not responding after the first mailing
and the postcard follow-up were sent another questionnaire and
reminder to complete the survey.

Direct experience of the user was measured by asking how
many times he or she had visited the BWCAW or similar areas in
the past five years. The user was also asked to rate their
experience as a wilderness user on a five point scale from no
experience to very high experience.

Prior knowledge was measured by asking the user to indicate
how adequate their knowledge was, prior to their trip, concerning
items such as the location of campsites in the BWCAW, safety in
the BWCAW, the type of clothing and gear to bring on a trip, the
best time of year to go to experience the best fishing and avoid
crowds and other aspects of BWCAW and general wilderness use,

that is, whether they felt "not at all knowledgeable", "slightly
knowledgeable", "somewhat knowledgeable", "moderately
knowledgeable" or "highly knowledgeable".

The status of the user in the social group was measured by
examining his or her role in party decisions. This was done by
asking the user, on a five point scale representing "doesn't
apply", "not involved", slightly involved", "moderately involved"
and "highly involved", how involved in the discussions prior to
and during the trip they were and the level to which other
members of the party looked to them for leadership, measured on a
five point scale including "strongly agree", "moderately agree",
"neither agree nor disagree", "moderately disagree" and "strongly
disagree".

Topic involvement was measured by asking the user questions
concerning his personal involvement and feelings toward the BWCAW
as a recreation and wilderness area. Issues such as the
importance of the BWCAW to one's family and friends, the
importance of maintaining the BWCAW as a wilderness area, and
personal feelings toward the BWCAW were measured on a five point
scale ranging from "strongly agree" to "strongly disagree". The
user's need for cognition had little to do directly with the
BWCAW, however, instead, measured the user's desire in solving
problems or puzzles and, in general, his or her tendency to
engage in activities that challenge their thinking abilities.
These items were sampled from a 45-item scale published by
Cacioppo and Petty (1982) and were measured using a five point

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scale ranging from "strongly agree" through "strongly disagree".
A reduced number of items was used to ease burden on respondents.

Source credibility was measured by asking questions concerning the user's attitude toward the quality of the job the Forest Service is doing in maintaining the BWCAW and also the effect the Forest Service has on preventing users from breaking the rules and regulations of the BWCAW. This section was also measured using a five point "strongly agree" to "strongly disagree" scale.

Analysis

Cluster analyses of individual variables were performed to create overall indices of the user characteristics, measured in the self report questionnaire. Variables for prior knowledge, direct experience, topic involvement, need for cognition, status in social group and source credibility were all obtained in this manner. Table I is a listing of the created indices (with individual questionnaire items making up the index) and the applicable reliability coefficient, cluster mean score and standard deviation. The mean scores and standard deviation of the individual items making up the created clusters are also presented in the table. Variables for each stage in the behavioral change process(elaboration, new information, change of old ideas and change of behavior), measured on the on-site interview form, were obtained via a subjective evaluation of the use and effectiveness of the information packet as a whole by the

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interviewer on site immediately following the questioning of the

subject on the individual brochures within the packet.

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Table I.	List of Variables Comprising User Characteristic Clusters		
USER CHARACTERISTICS	Reliability Coefficient	Mean Score	Standard Deviation
Prior Knowledge	.9366	1.97	.77
1. ...the location of campsites at the BWCAW.		2.21	1.33
2. ...aspects about safety in the BWCAW.		1.90	1.02
3. ...the best time of year to go to avoid crowds.		2.18	1.22
4. ...the best time of year to go to experience the best fishing.		3.03	1.40
5. ...the most functional clothing to bring.		1.55	.77
6. ...the type of gear necessary for your trip.		1.50	.81
7. ...dealing with bears.		2.00	1.03
8. ...obtaining a permit to use the BWCAW.		2.07	1.34
9. ...using the BWCAW without disturbing the natural environment.		1.55	.81
10. ...using the BWCAW without disturbing others.		1.55	.81
11. ...the location of entry points into the BWCAW.		2.22	1.27
12. ...use of fishing gear.		2.40	1.34
13. ...rules and regulations for the BWCAW.		2.03	1.14
14. ...types of wildlife in the BWCAW.		2.05	.91
15. ...surviving successfully in a wilderness setting.		1.77	.85
16. ...use of campfires in a way that does not damage the environment.		1.57	.80
Role in Party Decisions (Status in Party)	.7212	2.09	.84
1. On that trip, other members of the party tended to look to me concerning proper camping, canoeing or other wilderness use techniques.		2.01	1.10
2. On that trip, other members of the party sometimes looked to me for leadership in making decisions.		1.93	.98
3. I generally followed the lead of other members of the party in deciding where to go and what to do.		2.33	1.03

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Table I. (continued)

Personal Involvement with the Boundary Waters Canoe Area	.8115	1.77	.54

1. I think of the BWCAW as my second home. — 2.83 — 1.20
2. When I need to get away from it all, I come to the BWCAW. — 2.21 — 1.13
3. It bothers me when other people use the BWCAW in a way that disturbs the environment. — 1.13 — .38
4. I take pride in the BWCAW. — 1.22 — .50
5. I identify with the BWCAW more than other areas. — 1.99 — 1.03
6. The BWCAW is a traditional area for my friends and family to meet. — 2.95 — 1.35
7. I feel everything possible should be done to maintain the BWCAW as a wild and natural place for recreation. — 1.07 — .32
8. The BWCAW is an important wilderness area for my friends and family. — 1.72 — 1.02
9. I see the BWCAW as an irreplaceable wilderness resource. — 1.09 — .36
10. Recreation in an area like the BWCAW is an important part of my life. — 1.48 — .75

Need for Cognition	.7614	2.08	.54

1. I really enjoy a task that involves coming up with new solutions to problems. — 1.69 — .68
2. I prefer just to let things happen rather than try to understand why they turned out that way. — 1.87 — .92
3. I like tasks that require little thought once I have learned them. — 2.25 — 1.05
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities. — 1.73 — .83
5. I don't like the responsibility of handling a situation that requires a lot of thinking. — 1.65 — .78
6. I prefer my life to be full of puzzles that I must solve. — 2.60 — 1.04
7. It is enough for me that something gets the job done, I don't care how or why it works. — 1.94 — .86
8. I find little satisfaction in deliberating long and hard for hours. — 2.53 — 1.06
9. I would prefer complex to simple problems. — 2.55 — 1.00

Source Credibility	.7964	1.54	.43

1. I feel uncomfortable when speaking with a forest official because I am afraid I may have done something wrong. — 1.86 — 1.04
2. When participating in a wilderness activity at the BWCAW, I am very aware of the regulations regarding that activity. — 1.66 — .76
3. I always try to make sure my actions are within the rules and regulations of the U.S. Forest Service. — 1.39 — .62
4. I am careful about following the U.S. Forest Service rules and regulations because I believe they are set for a good reason. — 1.29 — .54
5. The rules and regulations set by the U.S. Forest Service are important in maintaining the BWCAW. — 1.25 — .50
6. The U.S. Forest Service officials go out of their way to bother BWCAW users. — 1.51 — .81
7. I like seeing U.S. Forest Service officials patrolling the BWCAW. — 2.03 — .96
8. When talking to a U.S. Forest Service official, I pay attention to what he/she has to say. — 1.55 — .70
9. I respect the authority of U.S. Forest Service officials. — 1.38 — .61
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Table I. (continued)

<u>Visitor Use Experience (Direct Experience)</u>	N/A	3.64	.94
1. Overall, how would you rate your experience as a wilderness user.		3.64	.94

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Path analysis was used in testing the hypotheses and the
model proposed in Figure I.

Results

A total of 413 users contacted at the BWCAW had received the
information packet from the Forest Service prior to taking their
trip. Of these 368 responded with the self-report questionnaire
subsequent to their trip representing an 89% response rate.

The Model.Figure 2 presents the proposed model of the
behavioral change process and how the user characteristics affect
this process, along with the significance of hypothesized
relationships between variables based on path analysis.

Path analysis showed that the model predicted overall
behavior change with an R squared of .41. Behavior change was
directly affected by the level of new information (beta = .55)
and the extent that old ideas were changed (beta = .15). New
information also directly affected the extent that old ideas were
changed (beta = .35). Message elaboration affected behavior
change indirectly by directly affecting new information (beta =
.43) and changing of old ideas (beta = .29). A significant path
was found from prior knowledge to message elaboration (beta =
-.25) and new information (beta = -.35). Furthermore, prior

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FIGURE MODEL WITH BETAS REPRESENTING SIGNIFICANT PATHS
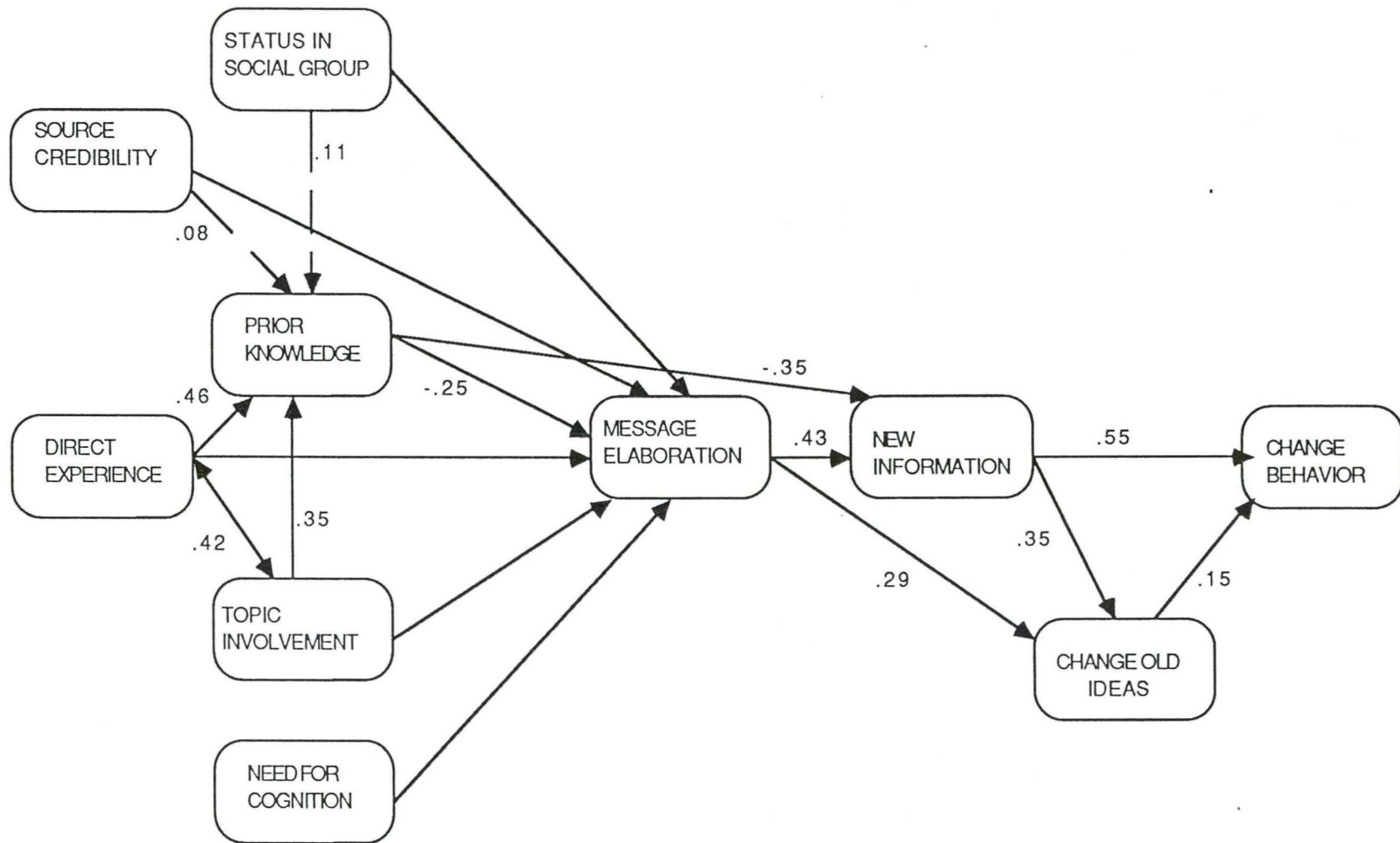
R SQUARED = .41

UNHOPOTHESIZED PATHS, BUT SIGNIFICANT

HYPOTHESIZED PATHS

knowledge was directly affected by the level of personal involvement (beta = .35) and direct experience (beta = .46) as well as status in social group (beta = .11) and source credibility (beta = .08). The hypothesized two-way relationship between direct experience and personal involvement was found to be significant also (beta = .42). Two hypothesized paths were found not significant. It was originally hypothesized that personal involvement would significantly effect the level of message elaboration, however, no significant path was found between these two variables. There was also a path hypothesized between need for cognition and message elaboration which was not found to be significant.

Descriptive statistics.Twenty-seven percent of the users indicated no elaboration of the information packet at all. Of those users showing elaboration of the brochures, 30% indicated low elaboration, 11% showed some elaboration, 18% indicated medium elaboration and 14% showed high elaboration of the information packet.

Most of the users indicated that they received no new information from the information packet (71%). However, of those users deriving new information, 19% found a low amount, 8% received a meduium amount and finally, 2% indicated a high amount of new information in the information packet.

Fifty-nine percent of the users indicated that the information packet did not change any of their old ideas regarding wilderness use and the BWCAW. Thirty seven percent

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indicated a low level of changing ideas, 2% a medium level and 2% a high level of changing of ideas due to the information packet.

Finally, a high majority of the users, 89%, indicated that their behavior was not changed due to the information in the information packet. Eight percent indicated a low level of behavior change, 2% a medium level and 1% a high level of behavior change due to the information in the Forest Service packets.

Discussion

Study results show general support for the theoretical model proposed in this study. Hypothesis 1 proposed that the level of behavior change is affected by the amount of new information acquired and the level of changing of ideas that occurred. Also, hypothesis 2 proposed that the level of message elaboration which takes place will have a direct effect on the amount of new information acquired and the level to which ideas were changed. This model suggests that the more one is involved in message elaboration the more likely they will be to form new beliefs (obtain new information and change old ideas) and, as a result, change their behavior, leading us to accept the first two hypotheses.

Hypothesis 3 may be accepted in that our model indeed shows a negative significant relationship between the level of prior knowledge of a user and the amount of new information derived from the persuasive communication.

Among those variables hypothesized to effect message elaboration, prior knowledge was clearly the strongest. We found that the more prior knowledge a person has, the less likely they will be to devote thought to a persuasive message and acquire new information from that message. The other user characteristics, topic involvement, need for cognition, status in social group and source credibility showed no significant effect on the level of message elaboration, allowing us to only partially accept hypothesis 4. The insignificance of the effect of personal involvement on message elaboration may be due to the operationalizing of the level of involvement. Our measure of topic involvement involved general attitudes toward the BWCAW. Perhaps this measure should have reflected involvement in specific topics mentioned in the information packet.

Although topic involvement did not affect message elaboration directly, we found that it did in fact have a significant effect on prior knowledge, as did direct experience, leading us to accept hypothesis 5. Hypothesis 6 may also be accepted in that we also found that direct experience and personal involvement were significantly related.

The unhypothesized significant relationship of status in party indicated, not surprisingly, that those persons who were most involved in the decision making process of the trip were those persons who had the most knowledge about the BWCAW and wilderness use. Similarly, those persons who saw the Forest Service as most credible were those persons possessing the

highest level of prior knowledge.

Further research is needed to test the applicability of this model in other recreation management situations. Of particular interest would be the generalizability of the relationship between prior knowledge and message elaboration. It is significant that prior knowledge appears to be the key mediator in determining whether the user progresses through the behavioral change process. If this is the case, agencies diveloping an information campaign should keep in mind the level of knowledge of the users they are trying to reach. If the user is generally knowledgeable about an area and its use, an informational campaign which seems to merely reinforce what the user already knows, or believes he or she knows, will do little in causing any change in behavior. Any change of behavior desired in these types of users may require either presentation of new information not generally known to the knowledgeable user or presentation of the desired changes of behavior in ways other than by simply providing information, i.e., more obtrusive methods of persuasion. On the other hand, if the user is generally not knowledgeable about an area and its use, an informational campaign may prove effective in causing the user to think about the information provided and subsequently desired behavior.

Literature Cited

Abelson, R.P. 1976. Script processing in attitude formation and decisionmaking. In Cognition and Social Behavior. J. Carroll & J. Payne (ed.), pp. 33-46. Hillsdale, NJ: Erlbaum. 290 pp.

Assael, H. 1984. Consumer Behavior and Marketing Action. (2nd ed.) Kent Publishing Co.: Boston, MA 695 pp.

Aveni, A.F. 1976. Alternative stratification systems: the case of interpersonal respect among leisure participants. Sociological Quarterly 17:53-64.

Baas, J.M., M.J. Manfredo, D.J. Allen and M.E. Lee. 1988. Evaluation of an information brochure for promoting charterboat trip opportunities along the Oregon Coast. The Journal of Travel Research.

Brown, P.J. and J.D. Hunt 1969. The influence of information signs on visitor distribution and use. Journal of Leisure Research. 1:1:79-83.

Chaiken, S. 1980. Heuristic versus systematic information processing and the use of source versus message cues in persuasion. Journal of Personality and Social Psychology, 39, 752-766.

Cohen, A.R. 1957. Need for cognition and order of communication as determinants of opinion change. In C. I. Hovland (ed.), The order of presentation in persuasion. New Haven, CN, Yale University Press.

Craik, F.I.M. and R.S. Lockhart. 1972. Levels of processing: a framework for memory research. Journal of Verbal Learning and Verbal Behavior. 11:671-84.

Davidson, A.R., S. Yantis, M. Norwood, and D.E. Montano. 1985. Amount of information about the attitude object and attitude-behavior consistency. Journal of Personality and Social Psychology. 49:5:1184-1198.

Fazio, R.H. and M.P. Zanna. 1981. Direct experience and attitude-behavior consistency. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology. (Vol. 14, pp. 161-202. New York: Academic Press).

Johnson, E.J. and J.E. Russo. 1984. Product familiarity and learning new information. Journal of Consumer Research. 8:151-55.

Kirchler, E. and J.H. Davis. 1986. The influence of member status differences and task type on group consensus and member position change. Journal of Personality and Social Psychology. 51:1:83-91.

Kisielius, J. and B. Sternthal. 1984. Detecting and explaining vividness effects in attitudinal judgments. Journal of Marketing Research. 21:54-64.

Krumpe, E. and P.J. Brown. 1982. Redistributing backcountry use through information related to recreation experiences. Journal of Forestry. June 360-362,364.

Langer, E., A. Blank, and B. Chanowitz. 1978. The mindlessness of ostensibly thoughtful action: the role of the "placebic" information in interpersonal interaction. Journal of Personality and Social Psychology 36:635-42.

Leippe, M.R. and R.A. Elkin. 1987. When motives clash: Issue involvement and response involvement as determinants of persuasion. Journal of Personality and Social Psychology. 52:2:269-278.

Maddux J.E. and R.W. Rogers. 1980. Effects of Source Expertness, Physical Attractiveness, and Supporting Arguments on Persuasion. Journal of Personality and Social Psychology. 39:2:235-244.

Petty R.E. and J.T. Cacioppo. 1979. Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. Journal of Personality and Social Psychology. 37:1915-1926.

Petty, R.E., J.T. Cacioppo and M. Heesacker. 1981. The use of rhetorical questions in persuasion: A cognitive response analysis. Journal of Personality and Social Psychology. 40:432-440.

Petty, R.E. and J.T. Cacioppo. 1981. Attitudes and persuasion: Classic and contemporary approaches. Dubuque, IA: Wm. C. Brown.

Petty R.E. and J.T. Cacioppo 1982. Need for Cognition. Journal of Personality and Social Psychology. 42:1:116-131.

Petty, R.E. and J.T. Cacioppo. 1986. The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology, 19:123-205. New York: Academic Press.

Roggenbuck, J.W. and D.L. Berrier. 1982. A comparison of the effectiveness of two communication strategies in dispersing wilderness campers. Journal of Leisure Research. 14:1:77-89.

Sample, J. and R. Warland. 1973. Attitude and prediction of behavior. Social Forces. 51, 292-304.

Schneider, W. and R.M. Shiffrin. 1977. Controlled and automatic human information processing. Detection, search and attention. Psychological Review. 84:1-66.

Sujan, M. 1985. Consumer knowledge: effects on evaluation strategies mediating consumer judgments. Journal of Consumer Research. 12:31-46.

Wood, W. 1982. Retrieval of attitude-relevant information from memory: effects on susceptibility to persuasion and on intrinsic motivation. Journal of Personality and Social Psychology. 42:798-810.

Wu, C. and D.R. Shaffer. 1987. Susceptibility to persuasive appeals as a function of source credibility and prior experience with the attitude object. Journal of Personality and Social Psychology. 52:4:677-688.

An Evaluation of BWCAW 1988
Wilderness Communication Efforts

Introduction

In evaluating the effectiveness of the BWCAW 1988 wilderness communication program, we examined the effects on four separate types of BWCAW user. Those user types are as follows:

1) the mail/outfitter group includes those respondents who applied for a BWCAW permit in advance (more than seven days prior to their trip), received a confirmation of their reservation along with the U.S.F.S. information packet in the mail, and equipped their trip through a professional outfitter.

2) the mail/private group includes those respondents who applied for a BWCAW permit in advance, received the permit and the U.S.F.S. information packet in the mail and equipped their trip on their own without any contact with an outfitter.

3) the personal/outfitter group includes those respondents who applied for their BWCAW permit less than seven days prior to their trip and equipped their trip through an outfitter. These people would not have received the U.S.F.S. information packet prior to this trip.

4) the personal/private group includes those respondents who applied for their BWCAW permit less than seven days prior to their trip and equipped their own trip. These people would also not have received the U.S.F.S. information packet prior to this trip.

The objective of this study was to compare the level of user characteristics (i.e., prior knowledge, direct experience, topic involvement, need for cognition, source credibility and role in

social group) and the levels of the behavioral change process
(i.e., elaboration, new information, change of old ideas and
behavior change) across the four identified user groups.

Analysis

Differences between user groups were examined on the
four variables in the persuasion process. Analysis of variance
and Student-Newman-Keuls tests for differences between means were
used to examine these differences. Descriptive statistics were
computed to examine the actual percentage of users, by identified
user group, who exhibited various levels of the behavioral change
process for the information packet as a whole and the individual
brochures within the information packet. Chi square statistics
were derived for each level of the behavioral change process for
individual brochures in order to identify differences in
responses across identified user group. Finally, an analysis of
covariance was performed in order to examine the differences in
the four identified user groups, controlling for the effects of
prior knowledge.

The level that each group went through the persuasion
process is based strictly on the effect of the information which
was directly contained in the brochures in the Forest Service
information packet.

Results

A total of 547 contacts were made on-site. Following is a

breakdown of the identified user groups:

Group	Number	Percent
mail/outfitter	69	12.6%
mail/private	344	62.9
personal/outfitter	87	15.9
personal/private	40	7.3
not usable	7	1.3
Total	547	100.0

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Table I.

Clustered variable means by user groups

	mail outfitter(a)	mail private(b)	personal outfitter(c)	personal private(d)	F-Test
User Characteristics					
Visitor Use Experience	3.47	3.81	3.69	3.51	2.05
Prior Knowledge	2.23[b]	1.86[acd]	2.07[b]	2.20[b]	5.74***
Involvement with the BWCAW	2.00[b]	1.71[a]	1.83	1.86	5.88***
Basic Characteristics	2.08	2.08	2.12	2.06	.13
Relationship with the U.S.F.S	1.56	1.52	1.61	1.59	.94
Role in Party Decision	2.13	2.04	2.79	2.40	2.11
Behavioral Change Process					
Elaboration	2.96[bcd]	2.56[acd]	1.05[ab]	1.00[ab]	55.49***
New Information	1.57[bcd]	1.37[acd]	1.03[ab]	1.00[ab]	14.48***
Change Ideas	1.59[cd]	1.45[cd]	1.04[ab]	1.02[ab]	19.29***
Change Behavior	1.22[cd]	1.13[c]	1.01[ab]	1.00[a]	4.62**

Note: Superscripts indicate the means of the categories of user that are significantly different at the .05 level

* $p < .05$
** $p < .01$
*** $p < .001$

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Table I is a summary of the means of each user characteristic and behavioral change process index compared across identified user group. The analysis of variance conducted for each index indicated that the means for "prior knowledge", "involvement with the BWCAW", "elaboration", "new information", "change ideas" and "change behavior" were significantly different across the user groups. In addition, the comparisons made between user groups indicated specific differences between groups concerning the user characteristic and behavioral change indices.

In examining the "prior knowledge" index, it appears that there is a significant difference in the amount of knowledge displayed by the identified user groups. The mail/outfitter group exhibited lower prior knowledge (2.23) than did the mail/private group (1.86). In addition, the mail/private group was significantly more knowledgeable than either the personal/outfitter (2.07) or the personal/private groups (2.20).

The mail/outfitter and mail/private groups were also seen to be significantly different in their involvement with the BWCAW, with the mail/private group being more involved with the area than the mail/outfitter group (1.71 versus 2.00 respectively). No other differences were found between identified user groups on the user characteristics.

Significant differences were found between the groups for the level of elaboration. The mail/outfitter group (2.96) exhibited significantly higher elaboration of the information received than did the mail/private (2.56), personal/outfitter

(1.05) and personal/private (1.00) groups. The mail/private
group's level of elaboration of information received was also
significantly greater than either of the "personal groups".

The same relationships were found with the level of new
information derived from information received. The
mail/outfitter group received significantly more new information
than did the mail/private group (1.57 versus 1.37, respectively),
a finding consistent with the results indicating that the
mail/outfitter group was less knowledgeable than the mail/private
group. In addition, both mail groups received significantly
greater new information than did either of the personal groups.

The level that the information changed old ideas of the user
did not differ significantly between the mail/outfitter and
mail/private groups. These groups, however, did exhibit a higher
changing of ideas (1.59 and 1.45 respectively) than did the
personal/outfitter (1.04) and personal/private (1.02) groups.
This appears to be due to the higher level of message elaboration
and new information by the "mail" groups over the "personal"
groups on the two types of information delivery.

There were also differences in the level of behavior
change that occurred. The "mail" groups exhibited slightly
greater behavior change (1.22 and 1.13) than did the "personal"
groups (1.01 and 1.00), although the "mail" groups themselves did
not differ significantly.

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Table II.

Breakdown of responses to overall measures
of the behavior change process by group
Overall Information Packet

	mail outfitter n=69	mail private n=344	Chi Square
Recall:			2.4
yes	100.0%	95.1%	
no		4.9%	
Elaboration:			7.3
none	14.5%	29.1%	
low	31.9%	30.2%	
some	13.0%	10.2%	
medium	24.6%	16.6%	
high	15.9%	14.0%	
New information:			3.2
none	62.3%	73.0%	
low	18.8%	19.2%	
medium	18.8%	6.1%	
high		1.7%	
Change ideas:			6.6
none	47.8%	61.3%	
low	46.4%	34.9%	
some	4.3%	1.5%	
medium	1.4%	2.0%	
high		.3%	
Change behavior:			2.4
none	84.1%	90.1%	
low	11.6%	7.3%	
medium	2.9%	2.0%	
high	1.4%	.6%	

‡ p < .05
‡‡ p < .01
‡‡‡ p < .001
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<u>Overall Information Packet</u>.Table II is a breakdown of responses based on the evaluation by the interviewer on the effect of the information packet as a whole across identified user group. There was no overall measure taken for the "personal" groups since there was no control over what they were told by the Forest Service or an outfitter, therefore, for the overall information packet, only the two "mail" groups were compared. All of those in the mail/outfitter group and nearly all in the mail/private group (95.1%) recalled receiving information prior to this trip.

The results for elaboration, new information, change ideas and change behavior indicate that those users going through an outfitter after receiving the information packet are more likely to 1) think about the information received and 2) progress through the behavioral change process. A greater percentage of users in the mail/outfitter group indicated going through some level of elaboration of the information packet than did those in the mail/private group (85.5% vs 70.9%, respectively). This is consistent with the results of the other stages in the behavior change process for the information packet as a whole i.e., new information (37.6% vs 27.0%), change old ideas (52.2% vs 38.7%) and change behavior (15.9% vs 9.9%).

<u>Individual Brochures</u>.Tables III through VIII are breakdowns of responses, based on evaluations of the interviewer, across identified user group, for each individual brochure in the information packet. For the individual brochures, comparisons were made involving both "personal" groups along with the "mail"

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groups. For all but the "gain while you give", Chi-square analysis revealed that the four identified user groups differed in terms of the level of recall and elaboration of the information and the extent to which the information changed old ideas. The "gain while you give" brochure showed no differences in the changing of old ideas, however, did show significant differences in new information across user groups.

The finding that those users going through an outfitter were affected more by the information in the information packet than private groups is consistent with the effects of the individual brochures. For each of the individual brochures, a higher percentage of the mail/outfitter group recalled seeing a particular brochure and subsequently progressed more often through the stages of the behavior change process than the mail/private group. In addition, the "personal" groups showed substantially less recall of information and, as a result, substantially less progression through the rest of the behavioral change process.

Although in general, the information packets elicited a small amount of new information, changing of ideas and changing of behavior, some individual brochures seemed to have a greater effect than others. The brochure concerning the presence of bears caused the greatest number of people to engage in elaboration, new information, and changing of ideas and behavior based on the information than any other individual brochure across all identified user groups. The brochure involving safety

in the Boundary Waters was the second most effective information in terms of the number of people who actually read it and progressed on to behavior change. The effect of the bear and safety brochures indicates that the most salient concern of users of the Boundary Waters may be insuring a safe trip. The wilderness challenge brochure (dealing with proper wilderness use) appeared to be the third most effective brochure in terms of the number of people heeding the information.

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Table III.

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Breakdown of responses to overall measures
of the behavior change process by group
Safety Brochure

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	mail outfitter n=69	mail private n=344	personal outfitter n=87	personal private n=40	Chi Square
Recall:					155.3***
yes	82.6%	73.3%	13.9%	12.5%	
no	17.4%	26.7%	86.1%	87.5%	
Elaboration:					172.0***
none	18.8%	28.8%	91.1%	89.6%	
low	33.3%	34.9%	3.8%	2.1%	
some	10.1%	5.5%		8.3%	
medium	8.7%	9.6%			
high	29.0%	21.2%			
New information:					9.4
none	84.1%	89.2%	93.7%	95.8%	
low	4.3%	2.9%	1.3%		
medium	10.1%	5.2%	5.1%	2.1%	
high	1.4%	2.6%		2.1%	
Change ideas:					55.1***
none	53.6%	67.7%	96.2%	95.8%	
low	40.6%	28.5%	1.3%	4.2%	
some	1.4%	.6%	1.3%		
medium	4.3%	2.6%	1.3%		
high		.6%			
Change behavior:					7.8
none	91.3%	95.3%	96.2%	97.9%	
low	4.3%	1.2%	2.5%		
medium	2.9%	2.3%	1.3%		
high	1.4%	1.2%		2.1%	

* p < .05
** p < .01
*** p < .001

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Table IV.

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Breakdown of responses to overall measures
of the behavior change process by group
Camping With Bears Brochure

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	mail outfitter n=69	mail private n=344	personal outfitter n=87	personal private n=40	Chi Square
Recall:					102.1***
yes	87.0%	73.8%	31.6%	22.9%	
no	13.0%	26.2%	68.4%	77.1%	
Elaboration:					140.8***
none	13.0%	27.6%	79.7%	83.3%	
low	21.7%	22.4%	6.3%	4.2%	
some	11.6%	9.9%	3.8%	10.4%	
medium	18.8%	14.8%	6.3%	2.1%	
high	34.8%	25.3%	3.8%		
New information:					16.7
none	75.4%	83.1%	91.1%	97.9%	
low	2.9%	3.2%	1.3%		
medium	17.4%	10.5%	7.6%		
high	4.3%	3.2%		2.1%	
Change ideas:					41.3***
none	50.7%	63.7%	87.3%	91.7%	
low	39.1%	29.7%	8.9%	8.3%	
some	2.9%	.9%	1.3%		
medium	5.8%	5.2%	2.5%		
high	1.4%	.6%			
Change behavior:					12.2
none	87.0%	93.6%	96.2%	97.9%	
low	4.3%	2.3%	2.5%		
medium	4.3%	3.2%	1.3%		
high	4.3%	.9%		2.1%	

* p < .05
** p < .01
*** p < .001
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Breakdown of responses to overall measures
of the behavior change process by group
Natural Fires Brochure

	mail outfitter n=69	mail private n=344	personal outfitter n=87	personal private n=40	Chi Square
Recall:					185.1***
yes	81.2%	70.1%	5.1%	2.1%	
no	18.8%	29.9%	94.9%	97.9%	
Elaboration:					153.5***
none	27.5%	34.9%	93.7%	97.9%	
low	36.2%	38.7%	2.5%		
some	5.8%	2.3%			
medium	8.7%	7.0%	1.3%	2.1%	
high	21.7%	17.2%	2.5%		
New information:					15.6
none	84.1%	91.0%	97.5%	100.0%	
low	4.3%	3.8%	1.3%		
medium	10.1%	4.1%	1.3%		
high	1.4%	1.2%			
Change ideas:					35.5***
none	66.7%	79.7%	96.2%	97.5%	
low	29.0%	18.6%	1.3%	2.5%	
some	1.4%	.6%	1.3%		
medium	2.9%	.9%	1.3%		
high		.3%			
Change behavior:					7.8
none	95.7%	98.8%	97.5%	100.0%	
low	2.9%	.3%	1.3%		
medium	1.4%	.6%	1.3%		
high		.3%			

‡ p < .05
‡‡ p < .01
‡‡‡ p < .001

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Table VI.

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Breakdown of responses to overall measures
of the behavior change process by group
Wilderness Challenge Brochure

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	mail outfitter n=69	mail private n=344	personal outfitter n=87	personal private n=40	Chi Square
Recall:					55.8***
yes	79.7%	73.0%	34.2%	47.9%	
no	20.3%	27.0%	65.8%	52.1%	
Elaboration:					91.5***
none	23.2%	32.3%	75.9%	72.9%	
low	30.4%	32.6%	15.2%	16.7%	
some	10.1%	3.5%	1.3%	6.3%	
medium	11.6%	10.8%	3.8%	4.2%	
high	24.6%	20.9%	3.8%		
New information:					5.5
none	91.3%	90.4%	93.7%	93.8%	
low		1.7%	1.3%		
medium	7.2%	4.9%	5.1%	4.2%	
high	1.4%	2.9%		2.1%	
Change ideas:					32.3**
none	59.4%	71.5%	91.1%	89.6%	
low	37.7%	25.3%	5.1%	8.3%	
some	1.4%	.6%	1.3%		
medium	1.4%	2.3%	2.5%	2.1%	
high		.3%			
Change behavior:					11.2
none	92.8%	96.8%	94.9%	97.9%	
low	4.3%	1.7%	2.5%		
medium		.9%	2.5%		
high	2.9%	.6%		2.1%	

 * p < .05
 ** p < .01
*** p < .001

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Table VII.

Breakdown of responses to overall measures
of the behavior change process by group
Group Size Brochure

	mail outfitter n=69	mail private n=344	personal outfitter n=87	personal private n=40	Chi Square
Recall:					168.5***
yes	79.7%	70.3%	8.9%	4.2%	
no	20.3%	29.7%	91.1%	95.8%	
Elaboration:					175.9***
none	21.7%	34.0%	94.9%	97.9%	
low	39.1%	36.9%	1.3%		
some	15.9%	4.9%		2.1%	
medium	7.2%	7.6%	1.3%		
high	15.9%	16.6%	2.5%		
New information:					14.0
none	87.0%	92.2%	94.9%	97.9%	
low	5.8%	2.9%			
medium	7.2%	3.2%	5.1%		
high		1.7%		2.1%	
Change ideas:					37.4***
none	68.1%	77.6%	94.9%	100.0%	
low	29.0%	20.3%	1.3%		
some	1.4%	.6%	1.3%		
medium	1.4%	1.2%	2.5%		
high		.3%			
Change behavior:					15.0
none	95.7%	99.1%	97.5%	97.9%	
low	2.9%		1.3%		
medium	1.4%	.3%	1.3%		
high		.6%		2.1%	

  * p < .05
 ** p < .01
*** p < .001

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Table VIII.
                        Breakdown of responses to overall measures
                           of the behavior change process by group
                                Gain While You Give Brochure


                   mail         mail         personal     personal     Chi
                   outfitter    private      outfitter    private      Square
                   n=69         n=344        n=87         n=40


Recall:                                                                123.1***
  yes              100.0%       95.1%        1.3%         10.4%
  no                            4.9%         98.7%        89.6%

Elaboration:                                                           120.8***
  none             31.9%        39.2%        92.4%        91.7%
  low              39.1%        37.2%        2.5%         2.1%
  some             5.8%         3.5%         2.5%
  medium           5.8%         5.5%         1.3%         6.3%
  high             17.4%        14.5%        1.3%

New information:                                                        16.9*
  none             87.0%        88.7%        98.7%        100.0%
  low              1.4%         3.5%
  medium           7.2%         5.8%         1.3%
  high             4.3%         2.0%

Change ideas:                                                          20.2
  none             73.9%        84.3%        96.2%        93.8%
  low              23.2%        14.0%        2.5%         6.3%
  some             1.4%         .9%
  medium           1.4%         .6%          1.3%
  high                          .3%

Change behavior:                                                       14.2
  none             95.7%        98.8%        98.7%        100.0%
  low              2.9%                      1.3%
  medium           1.4%         .3%
  high                          .9%

  * p < .05
 ** p < .01
*** p < .001

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Further analysis involved the investigation of the possibility that differences found between the four identified user groups were due to levels of prior knowledge. Analysis of covariance was performed to determine if there were differences in the behavioral change process among the four identified user groups, controlling for the effects of prior knowledge. Table IX shows the results of analysis of covariance when all four identified user groups are compared. This table shows that while controlling for the effects of prior knowledge, there are significant differences in the four groups in terms of their level of progression through the behavioral change process. This is may be due to the differences between the "mail" groups and the "personal" groups. These groups received information from different sources, and as indicated by the analysis of variance performed, differed greatly in the level of elaboration of the information recieved from the different sources. Thus, these findings may be due to differences in source of information rather than any significant differences across user groups in prior knowledge.

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Table IX.                      Results of Analysis of Covariance controlling for
                                        the effects of Prior Knowledge
                                    (using all four identified user groups)

                              Elaboration    New Information   Change old Ideas    Change Behavior
Source of Variation             F ratio         F ratio           F ratio             F ratio
Covariate
  Prior Knowledge              11.06***        70.40***          8.64***             32.64***

Main Effects
  Identified User Groups       32.86***        10.11***          11.27***            3.12**

*    p < .05
**   p < .01
***  p < .001


===============================================================================================
```

Due to the difference in source of information among the "mail"
groups and the "personal" groups, a second analysis of covariance
was performed, again controlling for prior knowledge, using only
the two identified user groups who actually received the
information packet from the Forest Service, the mail/outfitter
group and the mail/private group. Table X indicates that,
controlling for prior knowledge, there are no significant
differences in any level of behavioral change process between the
mail/outfitter group and the mail/private group. This finding
indicates that prior knowledge may be the primary mediator in
determining the extent to which the user progressed through the
behavioral change process, regardless of whether that user
arranges the trip on his or her own or through an outfitter.

===

Table X.   Results of Analysis of Covariance controlling for
                                                   the effects of Prior Knowledge
                                        (using the mail/outfitter and mail/private groups)

	Elaboration F ratio	New Information F ratio	Change old Ideas F ratio	Change Behavior F ratio
Source of Variation				
Covariate				
Prior Knowledge	22.82***	93.87***	16.13***	40.49***
Main Effects				
Identified User Groups	.84	.32	.09	.26

*   p < .05
** p < .01
*** p < .001
===

Discussion

Differences in how various user groups apply information
received toward their trip bring to light important issues
involving the communication of such information to BWCAW users.
Of the groups receiving the information packet prior to their
trip, those going through an outfitter were more likely to
elaborate on the information and subsequently change their
behavior than those persons equipping their trip on their own.
However, it appears that this is due primarily to the fact that
persons going through an outfitter appeared to be less
knowledgeable than other users; specifically, the mail/outfitter
group and the personal/outfitter group were significantly less
knowledgeable than the mail/private group. Whether the user
arranges the trip through an outfitter or privately, the key
mediator in determining the level of elaboration and subsequent
behavior change is the prior knowledge of that user. We would
conclude that in developing an information campaign, a primary

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factor which should be taken into consideration is the level of

prior knowledge of the user who is the target of the information.

More glaring differences in elaboration of information is found

when comparing those persons receiving the information packet in

the mail and those going through the Forest Service or outfitter

personally. It is noteworthy that it is difficult to truly

compare the "mail" groups versus the "personal" groups since we

did not know and had no control over what the "personal" groups

were being told by the Forest Service and the outfitters.

Results showed that those persons going directly through the

Forest Service or an outfitter tended not to remember much about

what was told them concerning use of the BWCAW. This finding

does not appear to be attributable toward their level of prior

knowledge since the "personal" groups showed significantly less

knowledge than the mail/private group. This lack of recall may,

however, be due to the short time frame in which these people are

apparently planning their trip, leading them to take less care

with learning about the area they are about to enter into. It

also may indicate a problem with the quality or quantity of the

information they are receiving in person. As would be expected,

this lack of recall of receiving any information would prohibit

the user from progressing through the behavioral change process

of message elaboration, acquiring new information, changing old

ideas and eventually through behavior change. This may be

partially alleviated by making an information packet available to

all users, whether they apply for their permit far in advance of

their trip or only a few days prior. Continuity between the Forest Service and outfitters might also be improved by making the packet available through both groups rather than through the Forest Service only. It appears as though, due to the type of user the outfitter gets, that being a less knowledgeable user, he tends to weild more persuasive power than the Forest Service. Therefore, the Forest Service should try to work closely with the outfitters in order to ensure that its message is being relayed to all users who may benefit from it.

APPENDIX

Exhibit 1: On-site interview form for those users who received
           the information packet from the U.S. Forest Service
           prior to the trip (i.e., the mail/outfitter and
           mail/private groups). The percentages represent the
           responses of the mail/outfitter and mail/private
           groups combined.

Exhibit 2: On-site interview form for those users who did not
           receive the information packet from the U.S. Forest
           Service (i.e., personal/outfitter and personal/private
           groups). The percentages represent the responses of
           the personal/outfitter and personal/private groups
           combined.

Exhibit 3: The mail-back questionnaire sent to users contacted in
           person at the BWCAW.

Exhibit 4: Rating scales for indices on the on-site interview
           forms and mail-back questionnaires.

Exhibit 5: Information packet received from the U.S. Forest
           Service by those users applying for a permit more than
           seven days prior to their trip.

Exhibit 1.

Information Packet Form <u>76.5% (413)</u>

exit <u>39.7%</u>   enter <u>60.3%</u>

1. Outfitted Group <u>16.7%</u>   Private Group <u>83.3%</u>
2. On-site Permit   <u>2.4%</u>   Mail Permit   <u>97.6%</u>
3. Leader   <u>77.5%</u>   Member   <u>22.5%</u>
4. Activities:
   Camping <u>98.8%</u> Canoeing/paddle <u>98.3%</u> Canoeing/motor <u>1.9%</u>
   Motorboating <u>.7%</u> Hiking <u>4.6%</u> Fishing <u>86.7%</u> Other <u>.2%</u>
5. Number of people in party: <u>4.5 people</u>
6. Group type:
   Alone <u>1.5%</u>   Family and friends <u>17.8%</u> Friends <u>42.7%</u>
   Family <u>24.9%</u> Organized <u>11.1%</u>
7. Nights spent in the BWCAW: <u>4.2 nights</u>
8. Time spent reading information packet: <u>14.1 minutes</u>
9. Elaboration level:

	<u>Recall</u>	<u>Elaboration</u>	New <u>Information</u>	Changed <u>old ideas</u>	Changed <u>behavior</u>
Information Package	95.9%	73.4%	28.8%	40.9%	10.9%
"Safety"	74.8%	72.9%	11.6%	34.6%	5.3%
"Bears"	76.0%	74.3%	18.2%	38.5%	7.5%
"Natural Fires"	71.9%	66.3%	10.2%	22.5%	1.7%
"Wilderness Challenge"	72.9%	69.2%	9.4%	30.5%	3.9%
"Group Size"	71.9%	68.0%	8.7%	24.0%	1.5%
"Gain While You Give"	67.3%	62.0%	11.6%	17.4%	1.7%

10. Did you read the rules and regulations? yes <u>73.1%</u> no <u>26.9%</u>
11. When have you received the
    information packet?   never received it <u>0.00%</u>
                         this trip only   <u>53.0%</u>
                         not this trip, but previous trip <u>0.00%</u>
                         this trip and previous trip <u>47.0%</u>

12. Where is the packet now?   thrown away <u>6.1%</u>
                               saved for my reference <u>45.7%</u>
                               given to someone else <u>3.9%</u>
                               have it with me <u>36.5%</u>
                               not sure <u>7.8%</u>

Exhibit 2.

Personal Contact Form <u>23.5% (127)</u>

exit <u>29.1%</u> enter <u>70.9%</u>

1. Outfitted Group <u>23.6%</u>   Private Group <u>76.4%</u>
2. On-site Permit <u>100.0%</u>   Mail Permit   <u>0.0%</u>
3. Leader   <u>78.7%</u>   Member   <u>21.3%</u>
4. Activities:
      Camping <u>97.6%</u>   Canoeing/paddle <u>96.9%</u>   Canoeing/motor <u>.8%</u>
      Motorboating <u>0.0%</u>   Hiking <u>3.1%</u> Fishing <u>79.6%</u> Other <u>.8%</u>
5. Number of people in party: <u>3.42 people</u>
6. Group type:
      Alone <u>3.4%</u>   Family and friends <u>12.9%</u>   Friends <u>45.7%</u>
      Family <u>31.0%</u> Organized <u>6.9%</u>
7. Nights spent in the BWCAW: <u>3.69 nights</u>
8. Time spent speaking with outfitter or U.S.F.S: <u>10.43 minutes</u>
9. Elaboration level:

	Recall	Elaboration	New Information	Changed old ideas	Changed behavior
Safety	13.4%	9.4%	5.5%	3.9%	3.1%
Bears	28.3%	18.9%	4.9%	11.0%	3.1%
Natural Fires	3.9%	4.7%	1.6%	3.1%	1.6%
Wilderness Use	39.4%	25.2%	6.3%	9.4%	3.9%
Group Size	7.1%	3.9%	3.9%	3.1%	2.4%
Other	11.8%	7.9%	0.8%	4.7%	0.8%

10. Did you read the rules and regulations? yes <u>26.8%</u> no <u>73.2%</u>
11. Have you received the information packet
     previously? yes <u>48.8%</u> no <u>51.2%</u>

University of Illinois
Boundary Waters Canoe Area Wilderness
Questionnaire

Section I. Visitor Use Experience

1. How many times have you visited the Boundary Waters Canoe Area Wilderness in the past 5 years?_____times

2. How many times have you visited the Boundary Waters Canoe Area Wilderness and other similar areas in the past 5 years?_____times

3. Overall, how would you
rate your experience as a   no   slight   moderate   high   very high
wilderness user?   experience   experience   experience   experience   experience

Section II. Prior Knowledge and Experience

4. Please indicate the extent of knowledge you have concerning the following items. *Circle your responses.*

Before receiving your permit to use the Boundary Waters Canoe Area, how knowledgeable did you feel about;

-the location of campsites at the BWCAW?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-aspects about safety in the BWCAW?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-the best time of year to go to avoid crowds?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-the best time of year to go to experience the best fishing?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-the most functional clothing to bring?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-the type of gear necessary for your trip?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-dealing with bears?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable

-obtaining a permit to use the BWCAW?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-using the BWCAW without disturbing the natural environment?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-using the BWCAW without disturbing others?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-the location of entry points into the BWCAW?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-use of fishing gear?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-rules and regulations for the BWCAW?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-types of wildlife in the BWCAW?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-surviving successfully in a wilderness setting?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable
-use of campfires in a way that does not damage the environment?	Highly Knowledgeable	Moderately Knowledgeable	Somewhat Knowledgeable	Slightly Knowledgeable	Not at All Knowledgeable

Section III. Role in Party Decisions

5.   Please indicate the extent of your involvement in the decision making process for your trip to the Boundary Waters Canoe Area Wilderness during which you were interviewed. *Circle your responses.*

-When making plans to visit the BWCAW, how involved were you in the discussion regarding the trip?	Doesn't Apply	Not Involved	Slightly Involved	Moderately Involved	Highly Involved
-When making plans to visit the BWCAW, how involved were you in the final decision?	Doesn't Apply	Not Involved	Slightly Involved	Moderately Involved	Highly Involved
-On that trip, other members of the party tended to look to me concerning proper camping, canoeing or other wilderness use techniques.	Strongly Agree	Moderately Agree	Neither Agree nor Disagree	Moderately Disagree	Strongly Disagree

-On that trip, other members of the party
sometimes looked to me for leadership   Strongly   Moderately   Neither Agree   Moderately   Strongly
in making decisions.   Agree   Agree   nor Disagree   Disagree   Disagree

-I generally followed the lead of other
members of the party in deciding   Strongly   Moderately   Neither Agree   Moderately   Strongly
where to go and what to do.   Agree   Agree   nor Disagree   Disagree   Disagree

Section IV. Involvement with the Boundary Waters Canoe Area

8. The following statements describe your personal involvement and feelings toward the Boundary
Waters Canoe Area Wilderness. Please indicate the extent to which each of the following statements
describes how you feel about the Boundary Waters Canoe Area. *Circle your responses.*

-I think of the BWCAW as my second   Strongly   Moderately   Neither Agree   Moderately   Strongly
home.   Agree   Agree   nor Disagree   Disagree   Disagree

-When I need to get away from it all,   Strongly   Moderately   Neither Agree   Moderately   Strongly
I come to the BWCAW.   Agree   Agree   nor Disagree   Disagree   Disagree

-It bothers me when other people use the
BWCAW in a way that disturbs the   Strongly   Moderately   Neither Agree   Moderately   Strongly
environment.   Agree   Agree   nor Disagree   Disagree   Disagree

-I take pride in the   Strongly   Moderately   Neither Agree   Moderately   Strongly
the BWCAW.   .   Agree   Agree   nor Disagree   Disagree   Disagree

-I identify with the BWCAW more than   Strongly   Moderately   Neither Agree   Moderately   Strongly
other areas.   Agree   Agree   nor Disagree   Disagree   Disagree

-The BWCAW is a traditional area for   Strongly   Moderately   Neither Agree   Moderately   Strongly
my friends and family to meet.   Agree   Agree   nor Disagree   Disagree   Disagree

-I feel everything possible should be done
to maintain the BWCAW as a wild and   Strongly   Moderately   Neither Agree   Moderately   Strongly
natural place for recreation.   Agree   Agree   nor Disagree   Disagree   Disagree

-The BWCAW is an important wilderness   Strongly   Moderately   Neither Agree   Moderately   Strongly
area for my friends and family.   Agree   Agree   nor Disagree   Disagree   Disagree

-I see the BWCAW as an irreplaceable   Strongly   Moderately   Neither Agree   Moderately   Strongly
wilderness resource.   Agree   Agree   nor Disagree   Disagree   Disagree

-Recreation in an area like the BWCAW   Strongly   Moderately   Neither Agree   Moderately   Strongly
is an important part of my life.   Agree   Agree   nor Disagree   Disagree   Disagree

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-Visitor use of the BWCAW should be restricted to ensure maintenance of its wild and natural qualities.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

-The wildness of the BWCAW is not a particularly important factor in its providing satisfying recreation experiences.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

-People should be able to do what they want in the BWCAW as long as it doesn't disturb other people.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

Section V. Basic Characteristics

9. The following questions have little to do directly with the BWCAW, however, they will help us understand your answers better. Please indicate the extent to which the following statements most closely describes the type of person your are. *Circle your responses.*

-I really enjoy a task that involves coming up with new solutions to problems.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

-I prefer just to let things happen rather than try to understand why they turned out that way.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

-I like tasks that require little thought once I have learned them.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

-I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

-I don't like the responsibility of handling a situation that requires a lot of thinking.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

-I prefer my life to be full of puzzles that I must solve.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

-It is enough for me that something gets the job done, I don't care how or why it works.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

-I find little satisfaction in deliberating long and hard for hours.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

-I would prefer complex to simple problems.　Strongly Agree　Moderately Agree　Neither Agree nor Disagree　Moderately Disagree　Strongly Disagree

Section VI. Relationship with U.S. Forest Service

10. Please indicate the extent to which you agree or disagree with the following statements concerning how you feel about the U.S. Forest Service and its managing of the Boundary Waters Canoe Area. *Circle your responses.*

-I feel uncomfortable when speaking
 with a Forest official on site because
 I am afraid I may have done something   Strongly   Moderately   Neither Agree   Moderately   Strongly
 wrong.   Agree   Agree   nor Disagree   Disagree   Disagree

-When participating in a wilderness
 activity at the BWCAW,
 I am very aware of the regulations   Strongly   Moderately   Neither Agree   Moderately   Strongly
 regarding that activity.   Agree   Agree   nor Disagree   Disagree   Disagree

-I always try to make sure my actions
 are within the rules and regulations of   Strongly   Moderately   Neither Agree   Moderately   Strongly
 the U.S. Forest Service.   Agree   Agree   nor Disagree   Disagree   Disagree

-The penalties for breaking the rules and
 regulations of the U.S. Forest Service
 are an effective deterrent to violating   Strongly   Moderately   Neither Agree   Moderately   Strongly
 them.   Agree   Agree   nor Disagree   Disagree   Disagree

-The thought of getting caught prevents
 me from knowingly breaking U.S   Strongly   Moderately   Neither Agree   Moderately   Strongly
 Forest Service rules.   Agree   Agree   nor Disagree   Disagree   Disagree

-I don't worry too much about what
 the U.S. Forest Service will do to me   Strongly   Moderately   Neither Agree   Moderately   Strongly
 if I break its rules.   Agree   Agree   nor Disagree   Disagree   Disagree

-I generally don't think too much about
 the rules and regulations of the U.S.   Strongly   Moderately   Neither Agree   Moderately   Strongly
 Forest Service.   Agree   Agree   nor Disagree   Disagree   Disagree

-I am careful about following the U.S.
 Forest Service rules and regulations
 because I don't want to get caught   Strongly   Moderately   Neither Agree   Moderately   Strongly
 breaking them.   Agree   Agree   nor Disagree   Disagree   Disagree

-I am careful about following the U.S.
 Forest Service rules and regulations
 because I believe they are set for a   Strongly   Moderately   Neither Agree   Moderately   Strongly
 good reason.   Agree   Agree   nor Disagree   Disagree   Disagree

-The U.S. Forest Service does a good   Strongly   Moderately   Neither Agree   Moderately   Strongly
 job managing the wilderness areas.   Agree   Agree   nor Disagree   Disagree   Disagree

-The rules and regulations set by the
 U.S. Forest Service are important   Strongly   Moderately   Neither Agree   Moderately   Strongly
 in maintaining the BWCAW.   Agree   Agree   nor Disagree   Disagree   Disagree

-The U.S. Forest Service does a good job
 enforcing its rules and regulations in   Strongly   Moderately   Neither Agree   Moderately   Strongly
 the BWCAW.   Agree   Agree   nor Disagree   Disagree   Disagree

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-The U.S. Forest Service officials go out of their way to bother BWCAW users.	Strongly Agree	Moderately Agree	Neither Agree nor Disagree	Moderately Disagree	Strongly Disagree
-I like seeing U.S. Forest Service officials patrolling the BWCAW.	Strongly Agree	Moderately Agree	Neither Agree nor Disagree	Moderately Disagree	Strongly Disagree
-When talking to a U.S. Forest Service official, I pay attention to what he/she has to say.	Strongly Agree	Moderately Agree	Neither Agree nor Disagree	Moderately Disagree	Strongly Disagree
-I respect the authority of U.S. Forest Service officials.	Strongly Agree	Moderately Agree	Neither Agree nor Disagree	Moderately Disagree	Strongly Disagree

Section VII. Background Information

Please take just a few minutes to answer these last questions.

11. Your age is:_____years

12. Your sex is:_____Male _____Female

13. Please circle the highest level of education you have completed.

K 1 2 3 4 5 6 7 8 Elementary
9 10 11 12   High School
13 14 15 16   College or Vocational
17 18 19 20...   Post Graduate

Thank you very much for participating in our study

Questionnaire No._____

Exhibit 4.

Rating Scales for indices of on-site and mail back questionnaires

<u>On-site interview form</u>

<u>Recall</u>	<u>Elaboration</u>	New <u>information</u>	Changed <u>old ideas</u>	Changed <u>behavior</u>
1 = no	1 = none	1 = none	1 = none	1 = none
2 = yes	2 = low	2 = low	2 = low	2 = low
	3 = some	3 = moderate	3 = some	3 = moderate
	4 = moderate	4 = high	4 = moderate	4 = high
	5 = high		5 = high	

<u>Mail back questionnaire</u>

Visitor Use
<u>Experience</u>

1 = none
2 = slight
3 = moderate
4 = high
5 = very high

Prior
<u>Knowledge</u>

1 = high
2 = moderate
3 = somewhat
4 = slight
5 = not at all

Involvement with the BWCAW,
Basic characteristics,
<u>Relationship with the U.S.F.S.</u>

1 = strongly agree
2 = moderately agree
3 = neither
4 = moderately disagree
5 = strongly disagree
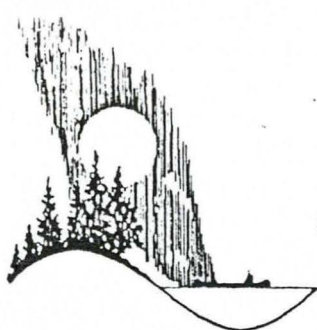
SAFETY FIRST

When you are in the BWCA Wilderness, you are on your own. With no doctors, no hospital and no emergency services available, you are responsible for the safety of your group. Listed below are some things you should pay particular attention to while on your wilderness trip.

Water quality: Although BWCAW lake water may look clear and pure, drinking it without filtering, boiling, or treating it may cause illness. One parasite in particular—*giardia lamblia*—is a problem in untreated backcountry water and can cause an unpleasant intestinal illness. All drinking water should be treated by one of the following methods:

> Bring water to a full boil—then let stand until cool enough to drink;

> Purify with a filter specifically designed to remove *giardia lamblia;* or

> Treat with a chemical specifically designed to kill *giardia lamblia.*

Help maintain water quality by using campsite latrines when possible. If you're not near a latrine—go back into the woods at least 150' from the shoreline; dig a hole 6-8" deep for your latrine; when finished, fill hole in and cover with needles and leaves. Use the same method for burying leftover food and fish entrails. All soaps pollute the water—wash dishes and bathe at least 150' from the shoreline.

Boating safety: The State of Minnesota requires that each person has a Coast Guard-approved personal floatation device in the boat or canoe at all times.

Travel: Remember that you are on your own with very few signs to guide you. Current, detailed maps and a compass are essential to finding your way. Keep your map in front of you and refer to it often.

Weather: If a storm is approaching, get off the water. Try to avoid traveling during periods of high wind.

Swimming: Always use the buddy system. Don't dive or jump from rocks and ledges without checking to see what's below the surface.

Rapids: Portages are there for a reason—use them. Generally speaking, rapids in the BWCA Wilderness are not safe to "run".

Hypothermia is the lowering of the body temperature. It can be serious, even fatal. Warning signs to look for are uncontrolled shivering, slurred speech, bluish tinge to lips, lack of coordination, and poor concentration. The victim must be put into a shelter out of the wind and wet clothes must be removed. The victim should rest until thoroughly warmed and completely recovered. If the victim suffers any lapses of consciousness, you may wish to seek medical attention.

Dehydration occurs when the body uses more fluids than are being replenished. It is important to drink plenty of water—bring flavored drink mixes if you are not used to the taste of lake water. Signs of dehydration include headaches and cold or flu symptoms.

Sunburn can spoil the fun on any vacation. Remember that you are getting the sun directly as well as reflected from the water and the canoe. Bring sunscreens and lotions and use them.

Leave a trip itinerary with someone at home. Include the party leader's name; entry point and date; exit point and date; make of car(s) driven and license number(s); number of people in party; number of canoes or boats; and name of outfitter, if you are being outfitted. Searches are not initiated by the Forest Service if a group doesn't exit as planned. If someone is concerned because you are late returning from your trip, they should contact the County Sheriff's Office.

A reminder: The best safety precaution is common sense, training in first aid and watching out for others in the group. Carry a complete first aid kit and know how to use it.

Emergencies: If, in spite of your efforts, someone becomes ill or injured, assess the seriousness of the situation. You are responsible for transporting the victim to the nearest medical facility. Evacuation by plane or other motorized means is approved only when there are no other alternatives available and the person needs the immediate services of a doctor. All emergency searches, rescues, and evacuations are authorized by the local county sheriff. If an evacuation is necessary, you will be billed for expenses incurred.

USDA
FOREST SERVICE

☆ GPO: 1987-743-631
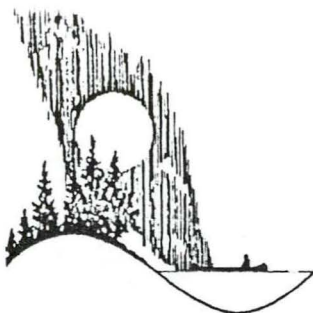
CAMPING
WITH BEARS

One of the many reasons people come to the Superior National Forest is to enjoy seeing native wildlife species in their natural habitat. While pleasing to watch, some of these animals have the ability to ruin your trip. Most notable is the black bear.

There are no hard and fast rules to insure protection from a bear. Bear behavior differs under different conditions. The bears you may encounter while visiting the Forest are wild animals and they can be dangerous.

Here are a few tips designed to help you prevent bear trouble during your visit:

- Bears have an excellent sense of smell and are attracted by food odors. Don't leave your food where they can get to it. While car-camping, keep your food in your vehicle, preferably in the trunk, at night or when you are away from the campsite.

- While camping in the wilderness or in the back-country, hang your food pack in the trees when you leave your site and at night. As a rule of thumb, remember that if an average sized person can touch the suspended pack, so can a bear. See illustrations on reverse side.

- Don't let an island campsite lull you into a false sense of security. Bears are very good swimmers.

- Keep a clean campsite. Burn all food scraps and left-over grease. Don't dispose of left-overs in the wilderness latrine. Bears will find them and destroy the latrine in the process.

- If you should leave your campsite, tie your tent flaps open. Bears are naturally inquisitive and may want to tour your temporary home. If the tent is closed, they may make a new doorway.

- NEVER store food in your tent. Bears will use their sense of smell and find any snack or candy bar you may try to hide.

- If a bear does wander into your campsite, don't panic. They are usually easily frightened by loud noises. Try yelling or banging some cooking pots together. Do not charge a bear—they may become defensive.

- In case a bear refuses to leave or becomes hostile, move to another campsite.

- Never stand between a mother and her cub. Female bears are extremely protective of their young.

Bears are a natural part of the Forest. If you have the misfortune to have your camp raided by one, before you get mad at the bear, look around your camp and ask, "Did I invite it?"

Following are illustrations of two ways to hang your food pack when camping in a wilderness or back-country. Bears will stand up on two legs and can even jump. They are very agile tree climbers and will climb out on a branch and reach down, or just climb the main trunk and reach out for your pack.

Hanging your pack by its shoulder straps will weaken or break them. Wrap rope around the pack.
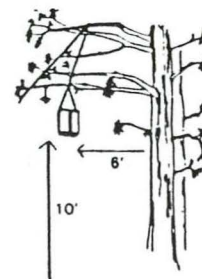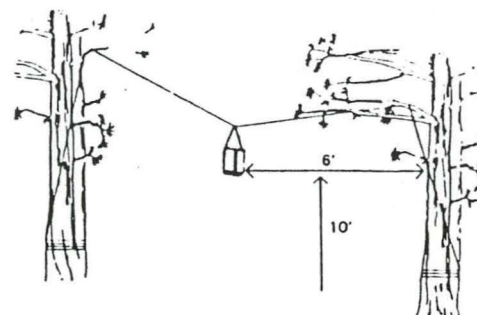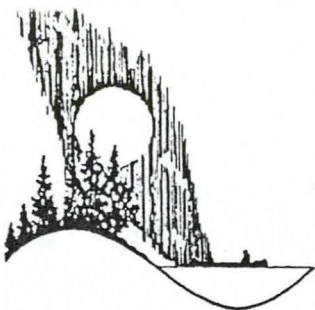
WILL YOU ACCEPT THE WILDERNESS CHALLENGE?

Wildernesses are managed to protect and maintain the environment in its natural state. As a wilderness visitor, your place within the wilderness is not as a conqueror or owner, but as a wise keeper of this land and water. The wilderness challenge is no longer "Can you survive the wilderness?" The challenge is now "CAN THE WILDERNESS SURVIVE YOU?"

Please do your part to preserve the BWCA Wilderness for the future by following these suggestions and reminders.

- **Keep your group size small.** If your group approaches the maximum size of ten, split up and travel separately. You will increase your enjoyment and decrease your impact on other visitors.

- **Travel and camp quietly.** You will increase your chances of seeing wildlife and enhance the wilderness experience for yourself and others. Remember that noise carries a great distance across water.

- **Make camp early enough in the day** to ensure finding an available campsite. Sites off main travel routes and in back bays provide more privacy and solitude.

- **Leave your axe at home.** They leave unnatural, unnecessary scars on trees and add weight to your pack.

- **Burn only dead wood** found lying on the ground. Collect your firewood away from campsites where it is more abundant.

- **Put all campfires DEAD OUT.** Douse with water and stir ashes until they are cold to touch with a bare hand.

- **Bring a small camp stove.** It heats quicker and cleaner than a fire and may come in handy during wet rainy weather.

- **Keep your drinking water clean.** All soaps pollute water. Bathe and wash dishes well away from lakes and streams.

- **Pack a bag to carry out litter** found on portages, landings and campsites. Pay particular attention to unburned foil, twist ties, and cigarette butts.

- **If you bring your dog,** please respect other visitors' rights. Keep dogs on a leash while on portages, and prevent excessive barking.

- **Leave your campsite as you found it.** Avoid removing rocks, flowers or moss. Refrain from cutting or peeling live trees. Leave things in their natural state so that others may enjoy them!

- **Help preserve America's cultural heritage** by leaving archaeological, historical, and rock painting sites undisturbed.

VOLUNTEER! Interested in doing more to help preserve the area? The Forest needs your help. Volunteer jobs range from carrying out extra litter and garbage on a canoe trip to spending a weekend building a ski/hiking trail to spending a summer cleaning and maintaining campsites in the BWCA Wilderness. To learn more about volunteering, write or call: Forest Supervisor; P.O. Box 338, Duluth, MN 55801; 218/720-5324.
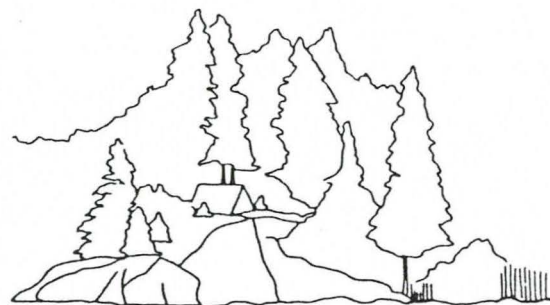
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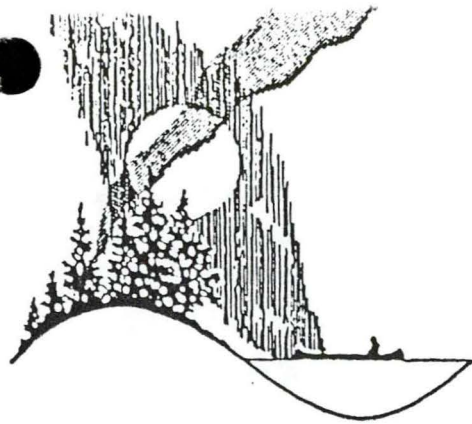
NATURAL FIRE
IN THE WILDERNESS

Visitors to the Boundary Waters Canoe Area Wilderness have the opportunity to witness the evidence of many natural forces at work in the constantly changing forest ecosystem. Wind, rain, snow, ice and sun have left their impact on the wilderness landscape. Perhaps the most dramatic change, however, results from fire. For centuries, lightning strikes have ignited fires which have affected the vegetation and wildlife habitat of the BWCAW.

Recognizing that lightning fires have a natural role within wilderness, the Forest Service has implemented a policy of allowing some lightning fires to burn without being suppressed if conditions are within certain limits. Such fires are called "prescribed" fires if the location, risks to property and public safety, weather factors and other conditions are within "prescribed" limits. Fires which are not within prescription and all human-caused fires will be suppressed.

(See Reverse for Safety Tips)

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Efforts will be made to inform the public of current fire activity. Notices will be posted at canoe landings and Forest Service field crews will often be knowledgeable of the fire situation. Local offices, businesses and the media will be notified about fire activity.

As a visitor you may encounter natural fires. At times, Forest Service personnel may not be present at the site, although all fires will be managed and under some form of surveillance. If you choose to observe the fire, please do so from a safe distance. Consider the following safety tips:

- Fires normally move in the same direction as the wind. Take note of the wind direction and find a safe location away from the fire's path. Obviously, do not camp near or directly downwind from a fire.

- Be careful while visiting a recent burn area. Ashes may remain hot for days and there is a danger of falling snags and tree limbs.

- Do not attempt to put a prescription fire out. As a natural fire, it is part of the wilderness. It is there for you and others to observe and will bring ecological changes which are consistent with wilderness management.

- Fires may smolder and burn very slowly for days or even weeks without much increase in size. Weather conditions can change quickly, however, causing dramatic and dangerous increases in fire size. Please respect all fire as potentially dangerous.

Wilderness fire will bring positive benefits by reducing heavy fuel accumulations, creating favorable wildlife habitat, changing the landscape, improving berry picking opportunities, etc. On the other hand, fire can also be devastating and visitors are asked to be responsible in preventing human-caused fires. Though we are learning to use fire more to our benefit, the long-standing Smokey Bear message of fire prevention is still valid. Please be careful.
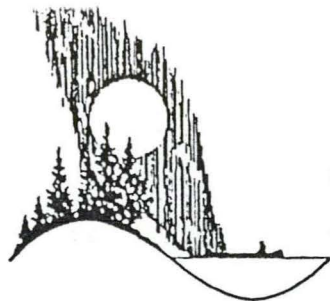
GROUP SIZE

PLEASE TAKE A MINUTE to think about your trip to the Boundary Waters Canoe Area Wilderness (BWCAW).

Group size in the BWCAW is limited to ten people at all times. This restriction is necessary because large groups:

1. cause more campsite deterioration and compaction;
2. create congestion problems at portages;
3. generally have a higher noise level;
4. cause greater visual impact on other visitors; and, if several large groups travel together,
5. tend to fill up lakes which have a limited number of campsites.

Because you plan to visit the BWCAW in a large group, we ask for your cooperation. Please minimize your effect on the resource and other visitors by splitting your group and traveling on completely different routes. You will eliminate the temptation to get together in groups larger than 10 and will increase the number of experiences and pictures to share when you return home.

Should you still choose to travel together, remember that there is a fine for having more than 10 people together at any time while visiting the BWCAW. The minimum penalty is $100 plus $10 for each person over 10. The fine is imposed on you, the party leader.

We sincerely hope that you decide to minimize your impact on the resource and other visitors by traveling on different canoe routes. If you need help in planning more than one route from a single entry point, please contact the Forest Service office closest to your entry point or an area outfitter.

THANKS FOR YOUR COOPERATION!

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GAIN WHILE YOU GIVE

Are you willing to take a few minutes during your trip to help preserve this unique area? Will you and your group make a commitment to doing just a "little bit extra" to ensure that the next visitor finds a pristine, unspoiled wilderness?

The Forest Service needs your help! While each visitor is responsible for following area rules and regulations, picking up litter, and following minimum-impact camping practices, successful preservation of the Boundary Waters Canoe Area Wilderness (BWCAW) depends on the help of a special group of people known as Superior National Forest Volunteers.

Volunteers are those visitors who are willing to spend a little more time and effort in their role as "caretakers" of their National Forest. Volunteer commitments can range from spending a few extra minutes picking up trash along portages and carrying it out to spending an entire summer as a Wilderness Rehabilitator, restoring worn BWCAW campsites to a more natural condition.

Volunteers may choose to spend their time and energy outside the BWCAW, as well. Projects are also available for groups to work on—for a weekend or a week.

Listed below are just some of the opportunities available for the right person who wants to "gain while you give":

- WILDERNESS RANGER - spend 8 days or more at a time in the BWCAW maintaining campsites, portages and hiking trails
- WILDERNESS REHABILITATOR - help restore worn BWCAW campsites to a more natural condition
- BACK COUNTRY RANGER - similar to a Wilderness Ranger, but working outside the BWCAW in other areas of the Superior National Forest
- RECREATION AID - provide day-to-day maintenance of campgrounds and road signs
- CAMPGROUND HOST - spend the summer in a Forest Service campground greeting campers, maintaining campground facilities, and answering questions
- WILDLIFE AID - assist wildlife biologists in improving wildlife habitat and conducting wildlife surveys
- TIMBER AID - work on reforestation and timber stand improvement projects—includes stocking surveys, hand release, and chainsaw use
- NATURALIST - work in cooperation with the Forest Service and local resorts and communities —provide interpretation through talks, nature walks and ecology games

Volunteering is not for everyone. It does provide an opportunity not found elsewhere, however—an opportunity to help maintain and improve Superior National Forest lands—to gain valuable work experience—to work with others who share the same concerns about the management of the National Forests—and to have the satisfaction of helping to enrich and preserve a heritage for future generations.

If you are that special person—one who is ready to accept the challenge and responsibility of doing your part to preserve your National Forest, whether you want to spend the summer or are willing to spend a little extra time picking up litter on a weekend trip, write or call for more information. We need your help!

For more information, write or call one of the following offices:

Volunteer Coordinator
Superior National Forest
Box 338
Duluth, MN 55801
218-720-5427

Aurora Ranger District
Box 391
Aurora, MN 55705
218-229-3371

Gunflint Ranger District
Box 308
Grand Marais, MN 55604
218-387-1750

Isabella Ranger District
2759 Highway 1
Isabella, MN 55607
218-323-7722

Kawishiwi Ranger District
118 South 4th Ave. E.
Ely, MN 55731
218-365-6185

LaCroix Ranger District
Box 1085
Cook, MN 55723
218-666-5251

Tofte Ranger District
Tofte, MN 55615
218-663-7981

Virginia Ranger District
505 12th Ave. W.
Virginia, MN 55792
218-741-5736

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